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**Marked-Up Copy of Amendments Submitted With  
Amendment; Response To Office Action Mailed March 24, 2003**

1058. (amended) A method of treating a hydrocarbon containing formation in situ, comprising:  
providing heat from one or more heaters positioned in one or more wellbores to at least a  
portion of the formation;

establishing a pyrolysis zone in at least the portion of the formation;

allowing the heat to transfer from the one or more heaters to ~~a~~ the pyrolysis zone of the  
formation;

controlling a pressure and a temperature in at least a majority of the pyrolysis zone,  
wherein the pressure is controlled as a function of temperature, or the temperature is controlled  
as a function of pressure;

controlling a pressure ~~within~~ in the formation to inhibit production of hydrocarbons from  
the formation having carbon numbers greater than 25; and  
producing a mixture from the formation.

1059. (amended) The method of claim 1058, wherein the one or more heaters comprise at least  
two heaters, and wherein superposition of heat from at least the two heaters pyrolyzes at least  
some hydrocarbons ~~within~~ in the pyrolysis zone of the formation.

1065. (amended) The method of claim 1064, wherein controlling the temperature comprises  
maintaining a temperature within the pyrolysis zone ~~within~~ in a pyrolysis temperature range.

1067. (amended) The method of claim 1058, wherein providing heat from the one or more  
heaters to at least the portion of the formation comprises:

heating a selected volume (V) of the hydrocarbon containing formation from the one or  
more heaters, wherein the formation has an average heat capacity ( $C_v$ ), and wherein the heating  
pyrolyzes at least some hydrocarbons ~~within~~ in the selected volume of the formation; and

wherein heating energy/day ( $P_{wr}$ ) provided to the selected volume is equal to or less than  $h \cdot V \cdot C_v \cdot \rho_B$ , wherein  $\rho_B$  is formation bulk density, and wherein an average heating rate ( $h$ ) of the selected volume is about 10 °C/day.

1069. (amended) The method of claim 1058, wherein providing heat from the one or more heaters comprises heating the ~~selected formation~~ pyrolysis zone such that a thermal conductivity of at least a portion of the pyrolysis zone is greater than about 0.5 W/(m °C).

1082. (amended) The method of claim 1058, wherein the produced mixture comprises a non-condensable component, wherein the non-condensable component comprises molecular hydrogen, wherein the molecular hydrogen is greater than about 10 % by volume of the non-condensable component at 25 °C and one atmosphere absolute pressure, and wherein the molecular hydrogen is less than about 80 % by volume of the non-condensable component at 25 °C and one atmosphere absolute pressure.

1085. (amended) The method of claim 1058, further comprising controlling the pressure ~~within~~ in at least a majority of the pyrolysis zone of the formation, wherein the controlled pressure is at least about 2.0 bars absolute.

1086. (amended) The method of claim 1058, further comprising controlling formation conditions to produce a mixture of condensable hydrocarbons and H<sub>2</sub>, wherein a partial pressure of H<sub>2</sub> ~~within~~ in the mixture is greater than about 0.5 bar.

1089. (amended) The method of claim 1058, further comprising:  
providing hydrogen (H<sub>2</sub>) to the ~~heated section~~ pyrolysis zone to hydrogenate hydrocarbons ~~within~~ in the ~~section~~ pyrolysis zone; and  
heating a portion of the ~~section~~ pyrolysis zone with heat from hydrogenation.

1091. (amended) The method of claim 1058, wherein allowing the heat to transfer ~~increases~~~~comprises increasing~~ a permeability of a majority of the pyrolysis zone to greater than about 100 millidarcy.

1092. (amended) The method of claim 1058, wherein allowing the heat to transfer ~~increases~~~~comprises substantially uniformly increasing~~ a permeability of a majority of the pyrolysis zone such that the permeability of the majority of the pyrolysis zone is substantially uniform.

5442. (amended) A method of treating a hydrocarbon containing formation in situ, comprising:  
providing heat from one or more heaters to at least a portion of the formation, wherein one or more heaters provides a heat output of less than about 1650 watts per meter;

establishing a pyrolysis zone in at least a portion of the formation;

allowing the heat to transfer from the one or more heaters to ~~a~~ the pyrolysis zone of the formation;

controlling a pressure and a temperature in at least a majority of the pyrolysis zone, wherein the pressure is controlled as a function of temperature, or the temperature is controlled as a function of pressure;

controlling a pressure ~~within~~ in the formation to inhibit production of hydrocarbons from the formation having carbon numbers greater than 25; and  
producing a mixture from the formation.

5444. (amended) The method of claim 5442, wherein at least one of the heaters ~~heater~~ comprises a natural distributed combustor.

5445. (amended) The method of claim 5442, wherein at least one of the heaters ~~heater~~ is disposed in an open wellbore.

5448. (amended) The method of claim 5442, wherein providing heat from the one or more heaters to the portion of the formation comprises:

heating a selected volume ( $V$ ) of the formation from one or more of the heaters, wherein the formation has an average heat capacity ( $C_v$ ), and wherein the heating pyrolyzes at least some hydrocarbons ~~within~~ in the selected volume of the formation; and

wherein heating energy/day ( $P_{wr}$ ) provided to the selected volume is equal to or less than  $h \cdot V \cdot C_v \cdot \rho_B$ , wherein  $\rho_B$  is formation bulk density, and wherein an average heating rate ( $h$ ) of the selected volume is about 10 °C/day.

5449. (amended) A method of treating a hydrocarbon containing formation in situ, comprising:  
providing heat from one or more heaters to at least a portion of the formation;  
allowing the heat to transfer from the one or- more heaters to a part of the formation;  
controlling a pressure and a temperature in at least a majority of the part of the formation,  
wherein the pressure is controlled as a function of temperature, or the temperature is controlled  
as a function of pressure;

controlling a pressure ~~within~~ in the formation to inhibit production of hydrocarbons from the formation having carbon numbers greater than 25; and

producing a mixture from the formation, wherein the mixture comprises condensable hydrocarbons.

5451. (amended) The method of claim 5459, ~~wherein~~ further comprising establishing a pyrolysis zone in the part of the formation ~~comprises a pyrolysis zone.~~

5452. (amended) The method of claim 5449, wherein at least one of the heaters ~~heater~~ comprises a natural distributed combustor.

5453. (amended) The method of claim 5449, wherein at least one of the heaters ~~heater~~ is disposed in an open wellbore.

5456. (amended) The method of claim 5449, wherein providing heat from the one or more heaters to the portion of the formation comprises:

heating a selected volume ( $V$ ) of the formation from one or more of the heaters, wherein the formation has an average heat capacity ( $C_v$ ), and wherein the heating pyrolyzes at least some hydrocarbons ~~within~~ in the selected volume of the formation; and

wherein heating energy/day ( $P_{wr}$ ) provided to the selected volume is equal to or less than  $h * V * C_v * \rho_B$ , wherein  $\rho_B$  is formation bulk density, and wherein an average heating rate ( $h$ ) of the selected volume is about 10 °C/day.